

SOME MEDUSAE FROM NORTHERN AUSTRALIA

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INTRODUCTION

A collection of Australian medusae has been sent to me from the South Australian Museum. With one exception (*Solmundella bitentaculata*) these medusae were collected at the Great Barrier Reef, North Queensland, between 20 Dec. 1958 and 19 Feb. 1959, and the collection was accompanied by notes on the appearance and behaviour of the living specimens and the conditions under which the catches were made. In the following account I take great pleasure in quoting these valuable and interesting observations, which were made by Dr. J. H. Barnes during his excursions among the islands of the Great Barrier Reef.

On a previous occasion I have dealt with the Hydromedusae of the Great Barrier Expedition, 1928-29 (Kramp, 1953). For morphological and taxonomic discussions, as also for references to the literature, I refer to that paper, though some additional remarks will be found in the following account.

The present collection contains 13 species of Hydromedusae and three species of Scyphomedusae. Only one of the species has not previously been observed in Australian waters; it is described below as a new species, *Melicertissa orientalis* n.sp.

I am greatly indebted to Dr. R. V. Southcott, of the South Australian Museum, because he has sent me this interesting collection.

SYSTEMATIC ACCOUNT,

with Dr. J. H. BARNES'S notes on appearance and behaviour of the living specimens.

Merga violacea (Agassiz and Mayer)

Pandea violacea Mayer, 1910, pp. 119, 490, Pl. 11, Fig. 7, Pl. 12, Fig. 1, text Fig. 64.

Merga violacea Kramp, 1953, p. 265.

Green Island, 8.I.59, one specimen, 6 mm. high and wide.

"Small colourless transparent jellyfish, bullet-shaped, with square opaque internal structures and eight peripheral tentacles half an inch long" (Barnes).

Distribution: Great Barrier Reef, Australia; Fiji Islands; Pacific coast of Mexico; Nicobar Islands; coasts of India; Mediterranean Sea; Bahama Islands; Tortugas, Florida.

Leuckartiara gardineri Browne

Leuckartiara gardineri Browne, 1916, p. 181, Pl. 39, Fig. 4.

Leuckartiara gardineri Kramp, 1953, p. 267.

Green Island, 8.I.59, one specimen.

"The little red stinger. Has a very high colourless and transparent apex, like a 'nosecone'. Below this cone the bell is thicker, with bright orange internal

organs and four long pink tentacles (one inch long) which inflict a surprising sting. The sting was so sharp that I felt that this tiny creature could not be the offender, but was convinced on repeating the experiment. The pain subsided rapidly and no local effects were visible on my leg. The specimen shrank to two-thirds life size immediately after preservation" (Barnes).

The original description of this medusa was based upon one single specimen from the Amirante Islands in the Indian Ocean (Browne, 1916), and I have previously seen two small specimens from the Great Barrier Reef; these are the only records up to now.

The present specimen is well preserved, 7 mm. high in the preserved condition; the apical projection is 2.5 mm. high, bluntly conical. The four perradial tentacles are closely spirally coiled and have evidently been very long when extended. They have no ocelli, but each of the basal bulbs has an abaxial endodermal spur which is continued as a narrow canal proceeding immediately below the exumbrellar epithelium almost to the top of the apical projection of the umbrella. Owing to contraction of the bell the canals are winding in a wave-like manner. In each quadrant there are five very small tentaculæ, exactly as described by Browne, the median one slightly larger than the others, which are decreasing in size towards both sides; each with a small abaxial, basal ocellus.

The folded gonads are exactly as figured by Browne, but there is no indication of a transversal bridge connecting the adradial gonads across the interradial space between them. Examination of more material may prove that this species does not belong to the genus *Leuckartiara*, which is characterised by "interradial gonads, horseshoe-shaped with folds directed perradially".

In the preserved specimen the walls of the stomach between the gonads have a bright red colour right down to the mouth lips, whose densely folded margin is white. The conical, basal part of the tentacle bulbs is red with a median, abaxial white line.

Distribution: Amirante Islands; Great Barrier Reef.

Laodicea indica Browne

Laodicea indica Browne, 1905b, p. 136, Pl. 1, Fig. 5, Pl. 4, Figs. 7-11.

Laodicea indica Kramp, 1953, p. 268.

Green Island, 21.XII.58, 4 specimens, diam. 8-9 mm. — "Colourless and transparent except for a white cross in the centre, as seen on a hot cross bun" (Barnes).

Green Island, 8.I.59, 2 specimens, diam. 9-10 mm. — "Colourless with faint blue cross-shaped marking and a fringe of numerous tentacles approximately 6 mm. long" (Barnes).

Distribution: Great Barrier Reef, Australia; Torres Strait; Malayan Archipelago; Ceylon; Trivandrum coast, India; Gulf of Aden, Arabia.

Melicertissa orientalis n.sp.

Green Island, 21.XII.58, one specimen.

The genus *Melicertissa* is characterised as Laodiceidae with eight simple, narrow radial canals. Five species are described. Dr. J. Picard (Marseilles) has informed me in a letter that *Melicertissa adriatica* Neppi is identical with *Octogonade mediterranea* Zoja, which belongs to the Mitrocomidae. *M. malayica* (Maas) is distinguished by its very large number of tentacles (about 160). The remaining three species, *M. clavigera* Haeckel, *M. platygastra* Nair, and *M. mayeri* Kramp, need some discussion before the identification of the present specimen can be stated.

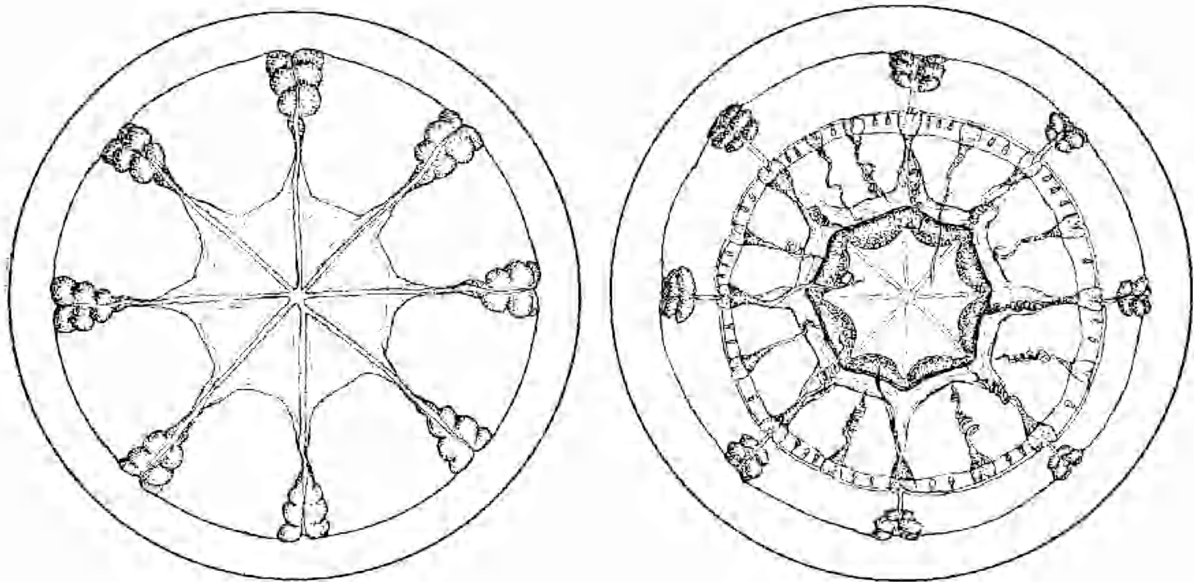
The shape of the tentacles and their basal bulbs is similar in all these species. Slight differences in the structure and position of the gonads may be

due to their stages of maturity. The width of the stomach and the vaulting of the umbrella may be dependent on the states of contraction. An adaxial ocellus is present at the base of each tentacle and cordylus in all the species.

There are, however, some distinguishing characters which seem to separate the three species mentioned above.

M. clavigera was described from the Canary Islands by Haeckel (1879, p. 135, Pl. 8, figs. 8-12). It was 10 mm. in diameter, with 8 tentacles and 24 cordyli; the stomach was narrow, and the eight mouth lips were very short. Two small but sexually mature specimens of apparently the same species are recorded from the Trivandrum coast, India, by Nair (1951, p. 59).

M. platygastra is described from a single specimen found at the Trivandrum coast, India (Nair, 1951, p. 60, Pl. 1, Figs. 16, 17). It is 7 mm. in diameter, it has



Figs. 1 and 2. *Melicertissa orientalis* n.sp.
Fig. 1, aboral view. Fig. 2, oral view.

8 tentacles (like *M. clavigera*), but a somewhat larger number of cordyli, 4-6 in each octant. The stomach is rather wide, and the species is mainly characterised by its mouth lips, which are long and lanceolate.

Mayer (1910, p. 210, Pl. 24, Figs. 2, 3) referred specimens from the Tortugas, Florida, to *M. clavigera*, though they had 16 tentacles (against 8 in *M. clavigera*), and there was only one cordylus between successive tentacles; the mouth lips were very short. Nair considered these specimens different from Haeckel's, and in accordance therewith I provided Mayer's specimens from Florida with a new name, *M. mayeri* (Kramp, 1959, p. 139).

In certain regards the present specimen from Australia differs from all these species. Examination of a greater number of specimens may reveal a variability which makes it necessary to regard them all as local forms of one species, *M. clavigera*. Provisionally it seems to me, however, more expedient to keep these species separate and describe the specimen from the Great Barrier Reef as representative of a new species.

Description of the specimen from Great Barrier Reef (Figs. 1-3).—The umbrella is flatter than a hemisphere; in its present condition, with the margin bent inward, the diameter is 11 mm. Jelly fairly thick. The stomach is broad and rather flat, 4 mm. wide; the mouth is widely open, octagonal, the mouth rim thin and smooth, with eight faintly indicated lips. The eight radial canals are continued inwards as eight narrow grooves meeting in the centre of the dorsal wall of the stomach. Outside the periphery of the stomach the radial canals are narrow, laterally compressed. The eight gonads occupy about two-fifths of the length of the radial canals, somewhat nearer to the ring canal than to the stomach; they are wavy, lateral bands with about five extensions, almost lamelliform, perpendicularly to each side. There are 17 marginal tentacles, all alike, the tentacle bulbs broadly conical with a heart-shaped base. Between successive tentacles there are 1-3, most frequently 2, cordyli, typically club-shaped, with a small distal eap of nematocysts. There is a small, black, adaxial ocellus at the base of each tentacle and cordylus.

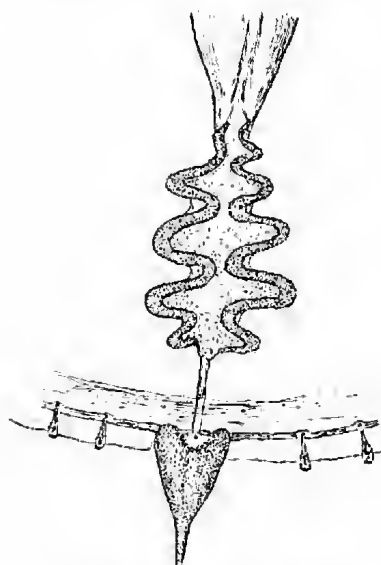


Fig. 3. *Melicertissa orientalis* n. sp. Gonad and part of bell margin, adaxial view.

The present species agrees with *M. mayeri* in the number of tentacles, but it has twice as many cordyli. *M. clavigera* and *platygastra* have only eight tentacles, and *M. platygastra* is also distinguished by its long, lanceolate mouth lips. A star-shaped figure in the centre of the stomach seems to be present in *M. clavigera*, but apparently not in *mayeri* and *platygastra*. Nematocysts in the cordyli are not mentioned in the descriptions of any of the other species; they are quite distinct in *M. occidentalis*, but are not indicated even in the enlarged figures by Haeckel (Pl. 8, Fig. 12) and Mayer (Pl. 24, Fig. 3).

As mentioned above, future studies may possibly show that these four species are identical; but since they are described from four very distant geographical regions, it would seem rather presumptuous to disregard the actual

morphological differences between them and unite them without decisive evidence.

Phialucium carolinae (Mayer)

Phialucium carolinae Mayer, 1910, p. 275, Pl. 36, Figs. 1', 1''.

Phialucium carolinae Kramp, 1953, p. 276, Figs. 2, 3.
(For further synonymy see Kramp, 1953.)

Green Island, 7.I.59, one specimen.

Palm Beach, near Cairns, 19.II.59, one specimen.

The specimen from Green Island is 18 mm. in diameter; it has 6 radial canals and 45 tentacles which, in the living specimen, were about 6 mm. long. The tentacles are all alike. Between successive tentacles usually only one very small rudimentary bulb and two marginal vesicles, but in some instances three young bulbs, the median one larger than the others, and four marginal vesicles. The gonads are narrow, along the distal one-third of the radial canals, but not quite reaching out to the umbrella margin. It was collected in shallow water at the north-eastern end of Green Island.

The specimen from Palm Beach is 14 mm. wide, with 4 radial canals and about 32 tentacles; it was found "alive but beached".

Both specimens are stated to be completely colourless when alive.

Distribution: Originally described from the southern parts of the east coast of North America. Recorded under different names from several localities in Indo-West-Pacific waters: India, the Nicobar Islands, the Nias Islands, the Philippines and Palao Islands, and southern China.

Eirene hexanemalis (Goette)

Eirene hexanemalis Mayer, 1910, p. 310, Fig. 171.

Eirene hexanemalis Kramp, 1953, p. 281, Fig. 5.

Green Island, 8.I.59, one specimen. "Transparent, six spokes, approximately forty tentacles a quarter inch long" (Barnes). The preserved specimen is 16 mm. in diameter.

Distribution: Widely distributed in the Indian Ocean and western Pacific, from Zanzibar in Africa to southern Japan.

Eutima curva Browne

Eutima curva Browne, 1905b, p. 138, Pl. 3, Figs. 1-3.

Eutima curva Mayer, 1910, p. 300.

Eutima curva Kramp, 1953, p. 288.

Green Island, 21.XII.58, two specimens: diameter 14 mm., with 4 tentacles and 77 marginal warts, peduncle 10 mm. long; diameter 16 mm., with 4 tentacles and 92 marginal warts, peduncle 18 mm. long. "In life they were colourless and completely transparent, but visible because of their refractile appearance, and the fact that they were swimming actively (approximately a half knot) against the tide stream. They had tentacles 4 inches (10 cm.) long before preservation, but I could detect no sting on contact" (Barnes).

Green Island, 8.I.59, two specimens: diameter 11 mm., with 4 tentacles and 68 marginal warts, peduncle crumpled; diameter 12 mm., with 4 tentacles and 124 marginal warts, peduncle 9 mm. long. "Tentacles not less than two inches (5 cm.) long. Tentacles can cause mild transient sting on the thin skin of a child" (Barnes).

In some of the specimens the cirri on the tentacle bulbs are lost.

Distribution: Ceylon; Torres Strait and Great Barrier Reef, Australia.

Aequorea australis* UchidaAequorea australis* Uchida, 1947, p. 307, Fig. 8.*Aequorea australis* Kramp, 1953, p. 290, Fig. 7.

Green Island, 20.XII.58, two specimens.

Green Island, 21.XII.58, two specimens.

"Blue stripes; present in large numbers" (Barnes).

The preserved specimens are measured as follows:

Diam. 8 mm., stomach 3.5 mm., tentacles 17 + 3 young ones, radial canals 18 fully developed, 2 half developed, no gonads.

Diam. 12 mm., stomach 4 mm., tentacles 20, radial canals 16 fully developed, with tiny gonads.

Diam. 19 mm., stomach 6 mm., tentacles about 24, radial canals 15 fully developed with well-developed gonads and 7 half developed without gonads.

Diam. 21 mm., stomach ? , tentacles 29, radial canals 22 fully developed with gonads.

Distribution: Great Barrier Reef and New Guinea; ? Philippines; southern China.***Aequorea pensilis* (Eschscholtz)***Aequorea pensilis* Mayer, 1910, p. 333.*Aequorea pensilis* Kramp, 1953, p. 295.

Cairns, at the Esplanade, 5.II.59, one specimen, diameter 34 mm., stomach 19 mm., 80 radial canals. "Colourless" (Barnes).

Aequorea macrodactyla* (Brandt)Aequorea macrodactyla* Mayer, 1910, p. 333.*Aequorea macrodactyla* Kramp, 1953, p. 294.

Green Island, 29.XII.58, one specimen (see below).

Green Island, 7.I.59, two specimens: Diam. 12 mm., stomach 5 mm., with 15 tentacles and about 80 radial canals; diam. 19 mm., stomach 13 mm., with 17 tentacles and about 100 radial canals. "Mauve stripes" (Barnes).

Large numbers were present on Dec. 29th, 1958, and Dr. Barnes has given an interesting account of the conditions under which they were observed. The preserved specimen is 32 mm. in diameter, the stomach 19 mm., there are 27 well-developed tentacles and 8 young tentacle bulbs, besides numerous rudimentary marginal warts; 70 radial canals, all with more or less well-developed gonads.

At first sight I was somewhat in doubt of the identification of this specimen. The dimensions and the numbers of tentacles and radial canals present no objection against referring it to *Ae. macrodactyla*, but the tentacle bulbs are not quite as we are accustomed to see them in the preserved specimens, in which they are usually very short and broad, with a prominent abaxial keel terminating above in a short and blunt spur. This is a very characteristic feature, distinguishing *Ae. macrodactyla* from all other species of *Aequorea*. In the present specimen the tentacle bulbs are as shown in Fig. 4, elongated conical, without a prominent keel, but with a pointed, triangular apical spur. This slender appearance, however, is evidently due to the fact that this specimen is in an uncommonly good state of preservation, with particularly well extended tentacles, some of them more than 4 cm. long and very thin. In life they were "approximately 3 inches (7.5 cm.) long". None of the other species of *Aequorea* possess tentacle bulbs with abaxial spurs. I do not hesitate, therefore, to refer this excellently preserved specimen to *Ae. macrodactyla*.

Distribution: Widely distributed in the warm parts of the Pacific and Indian Oceans from America to Africa; also recorded from the southern parts of the west coast of Africa, from the Patagonian coast of South America and from the West Indies.

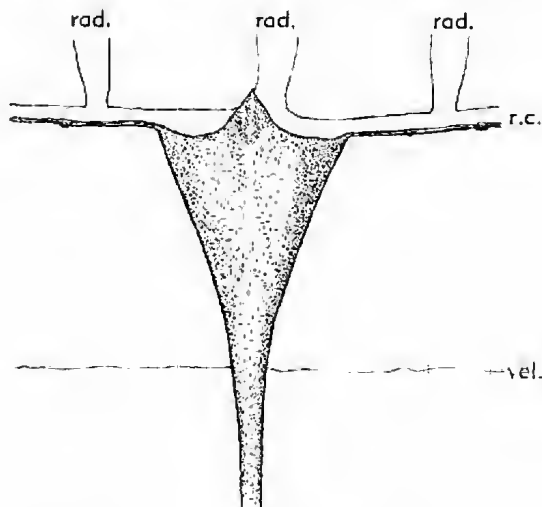


Fig. 4. *Acquorea macrodactyla*, basal bulb of a well-extended tentacle, abaxial view. *rad.*, radial canals. *r.c.*, ring canal. *vel.*, velum.

Olindias singularis Browne

Olindias singularis Browne, 1905a, p. 737, Pl. 57, Fig. 1.

Olindias singularis Mayer, 1910, p. 357.

Olindias singularis Kramp, 1953, p. 298.

Green Island, 8.I.59, one specimen, 26 mm. wide. — "Colourless jellyfish, bell translucent and colourless, crossed by two lines of white which widen out a quarter inch (ca. 6 mm.) from the centre. From this point outwards the lines have wavy brown markings superiorly and yellow flocculent masses inferiorly. Between these crossed bands, one-sixteenth of an inch (ca. 1½ mm.) from the centre, are four bright red dots. When viewed from the side these dots are seen to be columns of red specks running down beside the central tube. About 40 tentacles hang down one inch (ca. 2.5 cm.) from the periphery, which carries also seventy to eighty dark grey dots. This specimen was stranded on the sand but was still alive" (Barnes).

Distribution: Widely distributed in the tropical parts of the Indo-West-Pacific region.

Liriope tetraphylla (Chamisso and Eysenhardt)

Kramp, 1953, p. 301.

Green Island, 20.XII.58, one specimen, diameter 8.5 mm.

Distribution: All tropical and subtropical waters.

Solmundella bitentaculata (Quoy and Gaimard)

Kramp, 1953, p. 302.

Holothuria Banks, N.W. Australia, July 1958, one specimen, diameter 5.5 mm.

Distribution: Widely distributed in all the oceans, particularly common in the southern hemisphere.

***Nausithoë punctata* Kölliker**

Green Island, 21.XII.58, 5 specimens, 8-9 mm. wide.

Green Island, 8.I.59, one specimen, 8 mm. wide.

" . . . actively swimming jellyfish, having eight short tentacles (same size in life as in preservation) and readily visible because of the eight mauve-coloured areas placed in the radial line of the tentacles. These jellyfish consistently swim with the tide" (Barnes).

Distribution: Coastal waters of all tropical and warm seas.

***Pelagia noctiluca* (Forskål)**

Green Island, 8.I.59, one specimen, 20 mm. wide, rather crumpled.

"Pale brown jellyfish with eight tentacles, ca. 3½ cm. long, . . . bright yellow masses below the bell" (Barnes).

Distribution: Widely distributed in all warm and temperate seas.

***Cephea cephea* (Forskål)**

Cephea cephea Mayer, 1910, p. 654, text Fig. 406.

Green Island, 6.I.59 and 7.I.59, 5 specimens, 10-21 mm. in diameter. Margin vertical beyond the deep annular furrow of the exumbrella. The gelatinous warts in the central part of the exumbrella more or less flattened.

"Jellyfish coloured brownish-purple on top, purple underneath, with finely scalloped edges and fleshy frond-like mouth arms" (Barnes).

DR. J. H. BARNES'S OBSERVATION ON THE CONDITIONS UNDER WHICH THE CATCHES WERE MADE

(with addition of the species collected)

20 Dec. 1958, Green Island. Netted at 6.30 a.m., ten feet from beach on the N.E. head of Green Island, in two feet of water. (*Aequorea australis*, *Liriope tetraphylla*.)

21 Dec. 1958, Green Island, 7 a.m., shortly before high tide. Clear, bright morning, light northerly wind causing very small waves. Water exceptionally clear. Bottom clean sand. Numerous jellyfish were located in a narrow (? tidal) stream running towards the north-eastern end of Green Island, and apparently coming from the north. This stream of jellyfish turned eastward on nearing the beach, and followed the line of the shore about 10 feet out. The jellyfish were concentrated near the surface, in three feet of clear water. (*Meliceritissa orientalis*, *Laodicea indica*, *Eutima curva*, *Aequorea australis*, *Nausithoë punctata*.)

29 Dec. 1958, Green Island. Collected just below the surface in fifteen feet of water at twelve midday, on a full tide. Large numbers present about a hundred yards off the northern shore. Numerous salps were present among the jellyfish, and the latter were ingesting these salps in large numbers. Hot bright day with a light south-east wind. Northerly wind preceding two days. A young lad and I swam amongst these jellyfish for twenty minutes without receiving any sting. (*Aequorea macrodactyla*.)

6 Jan. 1959. Green Island. Collected at 7.30 a.m. in shallow water at north-eastern end of Green Island, about fifteen feet from shore, over clear sand. Clear, bright morning, tide just before full, wind strong northerly. (*Cephea cephea*.)

7 Jan. 1959. Green Island. Collected at 7.30 a.m., near full tide (extra high), water very clear, wind light variable northerly, in shallow water at the north-eastern end of Green Island, over clean sand. (*Phialucium carolinae*, *Aequorea macrodactyla*, *Cephea cephea*.)

8 Jan. 1959. Green Island. Collected 7.30 a.m., just after full tide in fairly rough, clean water. Wind northerly. (*Merga violacea*, *Leuckartiara gardineri*, *Luodicea indica*, *Eirene hexanemalis*, *Eutima curca*, *Olindias singularis*, *Nausithoe punctata*, *Pelagia noctiluca*.)

5 Feb. 1959. Cairns, at the Esplanade. Collected from prawn net at 6.30 p.m., a few feet from the beach. Dull day, very muddy water, strong south-west wind for five days, tide high. (*Aequorea pensilis*.)

19 Feb. 1959. Palm Beach, near Cairns. Time about 6.30 p.m., just after full tide, and following three days of strong northerly wind with high seas. (*Phialucium carolinae*.)

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